CYANIDE

CAS # 74-90-8, 143-33-9, 151-50-8, 592-01-8, 544-92-3, 506-61-6, 460-19-5, 506-77-4

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1997**

This fact sheet answers the most frequently asked health questions (FAQs) about cyanide. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Cyanide is a very poisonous chemical. Exposure to high levels of cyanide harms the brain and heart, and may cause coma and death. Exposure to lower levels may result in breathing difficulties, heart pains, vomiting, blood changes, headaches, and enlargement of the thyroid gland. Cyanide has been found in at least 415 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is cyanide?

(Pronounced sī′ə-nīd′)

Cyanide is usually found joined with other chemicals to form compounds. Examples of simple cyanide compounds are hydrogen cyanide, sodium cyanide and potassium cyanide. Cyanide can be produced by certain bacteria, fungi, and algae, and it is found in a number of foods and plants. In the body, cyanide combines with a chemical to form Vitamin B_{12}. Cyanide occurs naturally in cassava roots, which are potato-like tubers of cassava plants grown in tropical countries.

Hydrogen cyanide is a colorless gas with a faint, bitter, almond-like odor. Sodium cyanide and potassium cyanide are both white solids with a bitter, almond-like odor in damp air. Cyanide and hydrogen cyanide are used in electroplating, metallurgy, production of chemicals, photographic development, making plastics, fumigating ships, and some mining processes.

What happens to cyanide when it enters the environment?

- Cyanide enters the environment from both natural processes and human industrial activities.
- In air, cyanide is mainly found as gaseous hydrogen cyanide; a small amount is present as fine dust particles.
- It takes about 1–3 years for half of the hydrogen cyanide to disappear from the air.
- Most cyanide in surface water will form hydrogen cyanide and evaporate.
- Cyanide in water does not build up in the bodies of fish.
- At high concentrations, cyanide becomes toxic to soil microorganisms and can pass through soil into underground water.

How might I be exposed to cyanide?

- Breathing air, drinking water, touching soil, or eating foods containing cyanide.
- Smoking cigarettes and breathing smoke-filled air during fires are major sources of cyanide exposure.
- Breathing air near a hazardous waste site containing cyanide.
- Eating foods containing cyanide compounds, such as cassava roots, lima beans, and almonds.
- Working in an industry where cyanide is used or produced, such as electroplating, metallurgy, metal cleaning, and photography.

How can cyanide affect my health?

In large amounts, cyanide is very harmful to people. Expo-

sure to high levels of cyanide in the air for a short time harms the brain and heart, and may cause coma and death.

Exposure to lower levels of cyanide for a long time may result in breathing difficulties, heart pains, vomiting, blood changes, headaches, and enlargement of the thyroid gland.

People who eat large amounts of cyanide may have symptoms including deep breathing and shortness of breath, convulsions, and loss of consciousness, and may die. Use of cassava roots as a primary food source in tropical Africa has led to high blood cyanide levels.

People with high blood cyanide levels have also shown harmful effects such as weakness of the fingers and toes, difficulty walking, dimness of vision, deafness, and decreased thyroid gland function, but chemicals other than cyanide may have contributed to these effects. Skin contact with cyanide can produce irritation and sores.

It is not known whether cyanide can directly cause birth defects in people. Birth defects were seen in rats that ate diets of cassava roots. Effects on the reproductive system were seen in rats and mice that drank water containing sodium cyanide.

How likely is cyanide to cause cancer?

The EPA has determined that cyanide is not classifiable as to its human carcinogenicity. There are no reports that cyanide can cause cancer in people or animals.

Is there a medical test to show whether I've been exposed to cyanide?

There are medical tests to measure blood and urine levels of cyanide; however, small amounts of cyanide are always detectable in blood and urine. Tissue levels of cyanide can be measured if cyanide poisoning is suspected, but cyanide is rapidly cleared from the body, so the tests must be done soon after the exposure. An almond-like odor in the breath may alert a doctor that a person was exposed to cyanide.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level of cyanide in drinking water of 0.2 milligrams cyanide per liter of water (0.2 mg/L). The EPA requires that spills or accidental releases into the environment of 1 pound or more of hydrogen cyanide, potassium cyanide, sodium cyanide, calcium cyanide or copper cyanide be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) and (other recommendations) the American Conference of Governmental Industrial Hygienists (ACGIH) have set a permissible exposure limit of 5 milligrams of cyanide per cubic meter of air (5 mg/m^3) in the workplace during an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Source of Information

This ToxFAQs information is taken from the 1997 Toxicological Profile for Cyanide (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Animal testing is sometimes necessary to find out how toxic substances might harm people and how to treat people who have been exposed. Laws today protect the welfare of research animals and scientists must follow strict guidelines.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 404-639-6359. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.